Chapter 1

Airspace Control and Airspace Control Systems and Organizations: An Overview

All Army commanders must have a fundamental understanding of joint airspace control in a combat zone, the Theater Air-Ground System, and the key personnel and documents pertaining to airspace control. This chapter introduces airspace control in a combat zone, discusses the considerations of joint airspace control, summarizes the command and control systems from each service that make up the Theater Air-Ground System (TAGS), discusses liaisons, identifies the key joint airspace control positions, and discusses key documents necessary for planning and executing airspace control in a combat zone.

> Combat zone as used in this publication applies to the broadest interpretation of areas where combat forces are required to conduct operations, including operations other than war.

AIRSPACE CONTROL IN A COMBAT ZONE

1-1. JP 3-52 defines *airspace control in a combat zone* as a process used to increase combat effectiveness by promoting the safe, efficient, and flexible use of airspace. Airspace control is provided in order to prevent fratricide, enhance air defense operations, and permit greater flexibility of operations. Airspace control does not infringe on the authority vested in commanders to approve, disapprove, or deny combat operations.

CONTENTS

1-2. International agreements, enemy and friendly force structures, concepts of operations, and different operating environments all introduce different airspace command and control (C2) requirements. Airspace control must provide the joint force commander (JFC) with enough flexibility to effectively employ the joint force in either a joint or multinational campaign. Using current national military objectives and assigned missions as a baseline, the JFC develops specific concepts for combat zone airspace control in the joint force airspace control area. The airspace control area consists of airspace that is laterally defined by the boundaries of the area of operations. It may be divided into subareas.

CONSIDERATIONS OF JOINT AIRSPACE CONTROL

PRINCIPLES

1-3. Army airspace command and control (A2C2) planners must understand and consider the principles of joint airspace control when developing plans to support the ground commander's scheme of maneuver. The airspace control area defines a crucial battlespace dimension that all components of joint and multinational forces use to conduct their missions. Highly concentrated friendly aircraft, surface, subsurface, and air-launched weapon systems must share this airspace without one element hindering applying combat power by any other element. Joint airspace control primarily strives to enhance air, land, and maritime force effectiveness. Airspace control planners should consider these basic principles when developing any airspace control plan.

Principles

- **Unity of effort.**
- **Fratricide reduction and risk balance.**
- **Close liaison and coordination among all airspace users.**
- **Common airspace control procedures.**
- **Uncomplicated procedural controls.**
- **Reliable, jam-resistant, and secure C4ISR network.**
- **Durable and redundant systems.**
- **Ability to respond to evolving enemy threat conditions and evolving operation.**
- **Training for air traffic controllers that includes combat specific training.**
- **Emphasis on flexibility and simplicity.**
- **Capability to support day or night and adverse weather operations.**

1-4. The basis of the joint airspace control system is unity of effort. C2 procedures, when integrated into the joint system, must fully support the joint force commander's objectives. Successful operations depend on a fully coordinated and integrated airspace control system.

1-5. Closely coordinated airspace C2, fire support (to include attack operations), and air defense (AD) elements reduce the risk of fratricide. However, commanders must balance that risk with the requirements for an effective airspace defense.

1-6. Liaison and close coordination among all airspace users promotes timely and accurate information flow to airspace managers. The success of operations may directly relate to the effectiveness of this liaison and coordination. Therefore, airspace information systems identification procedures and AD procedures must be compatible. Some units refer to airspace information systems identification

procedures as "combat ID." The procedures, equipment, and terminology for airspace control, AD, military air traffic control, and C2 systems must be compatible, mutually supporting, and interoperable.

1-7. Common airspace control procedures within the airspace control area enhance the value of air operations. These procedures should maximize flexibility by effectively mixing positive and procedural control measures. The airspace command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) structure should permit close coordination between airspace managers and air, land, maritime, and special operations forces. It should allow concentrating combat power anywhere in an area of operations in minimal time. Procedural control should be uncomplicated and understood by all aircrew members and air traffic control personnel, AD weapon system operators, and airspace managers.

1-8. Ensuring that C4ISR procedures are compatible among all airspace managers and users requires coordination and detailed planning. The airspace C4ISR structure must have a reliable, jam-resistant, and, where appropriate, secure network. However, commanders must avoid using control procedures that rely heavily on voice communications. They should emphasize simple, flexible air traffic control (ATC) procedures. They also should make provisions to decentralize airspace C2 and to preserve flexibility and responsiveness should communications become degraded. Airspace C4ISR structure must be durable and redundant because enemy information operations will likely consider such structures to be high-priority targets.

1-9. The airspace C4ISR structure must respond to changing threat conditions as well as to the evolving operation. The design, responsiveness, and procedures of such structures should promote the rapid massing of combat power through simple design and detailed care in planning.

1-10. Airspace control functions in the combat zone rely on ATC resources. These functions still remain separate and distinct from real-time control of air vehicles and the terminal air traffic control environment. Air traffic controller training must augment peacetime conditions by conducting combat-specific air traffic control training tasks. In peacetime, personnel must exercise combat zone airspace control procedures to be effective in combat.

1-11. Airspace C2 balances various demands competing for airspace use. Planners must continue to emphasize flexibility and simplicity to maximize the force effectiveness using the system. Theater airspace control procedures must prevent mutual interference among airspace users, aid aircraft identification, and safely accommodate and expedite the flow of all air traffic in the theater of operations. Combat zone airspace control must be capable of supporting day, night, and adverse weather operations.

FUNDAMENTAL CONSIDERATIONS

1-12. The commander's operation plan (OPLAN), the airspace control plan (ACP), the airspace control order (ACO), and the air tasking order (ATO) are the keystones of airspace operations. Effective airspace use is critical to OPLAN success. Airspace control must effectively use combat operations without adding undue restrictions or adversely impacting the capabilities of any service or functional component. Other fundamental considerations include—

- Each service or functional component within a joint force operating various air platforms and weapon systems—including high- and low-speed, fixed- and rotary-wing, and manned and unmanned aircraft—within the airspace control area.
- Each service or functional component to use the airspace with maximum freedom consistent with the degree of risk operationally acceptable to the JFC.
- Forces coordinating airspace use with all other airspace users so as to integrate and synchronize offensive and defensive weapon systems and to ensure maximum effectiveness.
- The need to quickly and effectively discriminate between friendly, neutral, and enemy air operations and air platforms.
- Flexible airspace C4ISR structures that respond to the joint force's routine requirements as well as to surge operations when required.
- Closely coordinated and integrated surface operations, joint supporting fires, air operations, AD operations, special operations, and airspace control activities.
- The need to accommodate US, host nation, and multinational airspace control activities within the area of operations.
- The need to recognize saturated levels and limited airspace control networks.
- Temporary airspace control measures that restrict certain areas of airspace to allow subordinate commanders more freedom of operations.
- Detailed incorporation of coordinated offensive operations using electronic warfare (EW) elements, strike aircraft, and cruise missiles to ensure that defensive elements or procedures of the force do not unacceptably inhibit or degrade offensive capabilities.
- The need to ensure that the airspace control network remains survivable and effective.
- Standardized communications data, format, and language requirements in multinational operations to reduce possible differences in interpreting, translating, and applying airspace control procedures.
- The capability to support day, night, and adverse operations.
- The need to expediently distribute airspace control information.
- The need to operate in a nondigitized or partially digitized environment for prolonged periods.
- The integration of intelligence, surveillance, and reconnaissance (ISR) air operations into the airspace control area.

ELEMENTS

Operational Area Considerations

1-13. Each joint operations area (JOA) has unique airspace control requirements. As early as possible, planners determine these requirements based on the JFC's guidance and incorporate them into the overall joint force

Elements

- **Operational Area Considerations**
- **Airspace Control Planning**
- **Peacetime to Combat Considerations**
- **Integration of Airspace Control and Air Defense**
- **Airspace Control Methods**

planning effort. Political constraints, national and military ATC systems and procedures, and the capabilities and limitations of these systems are critical considerations. Rules of engagement (ROE), disposition of AD weapons, fire support plans, and procedures for identifying US and allied aircraft are also important. When developing procedures to implement these concepts, planners must consider the likelihood of multinational operations. They should develop techniques and procedures that work with the C4ISR structure as well as with the capabilities and methods of potential multinational partners. Planners should also consider the different control and identification capabilities and procedures of multinational or host-nation forces. US forces participating in multinational operations may also be subject to command arrangements outlined in international agreements. Planners must know which agreements apply to the force and how those agreements affect airspace C2. Planners have access to this information through the appropriate host-nation or multinational liaison officers located at the joint air operations center (JAOC).

Airspace Control Planning

1-14. Six broad principles of planning are essential to effective airspace command and control in a combat zone: support the joint force, interoperability, mass and timing, unity of effort, planning cycles, and degraded operations.

1-15. **Support the Joint Force.** Planners must integrate the airspace C4ISR structure to meet and complement the commander's operations plans. Airspace C2 must ensure the best use of joint, multinational, and interagency airspace assets. Planners must directly access and get involved in the planning cycle to input and receive information from each element contributing to the operational effort. Their full involvement in planning and subsequent coordination ensures that Army aspects of the airspace C4ISR structure fully support the joint force commander's vision.

1-16. **Interoperability.** Planning for airspace control must include planning for interoperability of equipment, personnel, and terminology. Forces must understand airspace control in both joint and multinational environments to operate effectively during conflict.

1-17. **Mass and Timing.** Airspace control planners must consider the volume of all airspace users—friendly, hostile, and neutral—generated during all aspects of operations. Planners must also consider timing constraints and fully integrate these factors into the need to quickly respond with adequate force to enemy intrusion.

1-18. **Unity of Effort.** Commanders should identify and exercise proper liaison between joint force components before hostilities begin. Representatives from different components should integrate information flow through the system and provide expertise to the airspace control authority (ACA).

1-19. **Planning Cycles.** Planners should integrate the airspace planning cycle with the operations planning cycle. Planners must consolidate input from all components and devise and disseminate the final airspace control plan. This plan may be an annex to the joint force OPLAN or operation order (OPORD).

1-20. **Degraded Operations.** The design of the airspace C4ISR structure lets planners anticipate the effects of enemy offensive information operations and

communications degradation. To ensure an effective structure, commanders should plan to use all communications means available, anticipating that the system could be fully operational, totally degraded, or somewhere in-between. Planners should prepare an airspace procedural control plan in case degraded communications occur preventing effective positive airspace control. Planners also should make plans for the effects of bad weather and limited visibility.

Peacetime to Combat Considerations

1-21. Commanders should continually update the ACP throughout an operation. They can then maintain airspace control even with sudden changes in mission, ROE, or task organization. A standing ACO should exist to provide immediate airspace control if a surprise attack, other unforeseen event, or change in mission occurs. Such changes often transpire during actual conflict, and their nature differs from theater to theater. The ACP should provide simple and clear instructions to transition from such peacetime situations to combat operations and facilitate integrating civilian and commercial air traffic as appropriate.

Integration of Airspace Control and Air Defense

1-22. Airspace control and AD operations can interfere with each other if they operate independently. Therefore, planners must prioritize, integrate, and closely coordinate airspace control and AD requirements. Airspace C2 procedures help identify aircraft, facilitate engagement of enemy aircraft, and provide safe passage of friendly aircraft. AD units must be free to engage hostile targets—aircraft and missiles—within prescribed ROE. However, planners must also establish procedures to identify friendly aircraft. These procedures should not delay offensive operations, being simple enough for both aircrews and ground operations personnel to execute. They should include visual, electronic, geographic, and maneuver procedures for differentiating friendly or hostile aircraft.

Airspace Control Methods

1-23. The airspace control structure needs to respond to the evolving enemy threat conditions and changing tactical situations. Methods of airspace control range from positive control of all air assets in an airspace control area to procedural control of air assets, or a combination of both. *Positive control* relies on positive identification, tracking, and direction of aircraft within the airspace control area. It uses electronic means such as radar; sensors; identification, friend or foe (IFF) systems; selective identification feature (SIF) capabilities; digital data links; and other elements of the intelligence system and C2 network structures.

1-24. *Procedural control* relies on a combination of mutually agreed and promulgated orders and procedures. These may include comprehensive AD identification procedures and ROE, aircraft identification maneuvers, fire support coordinating measures (FSCMs), and airspace control measures (ACMs). Service, joint, and multinational capabilities and requirements determine which method, or which elements of each method, that airspace control plans and systems use. Chapter 4 discusses A2C2 procedures.

THEATER AIR-GROUND SYSTEM

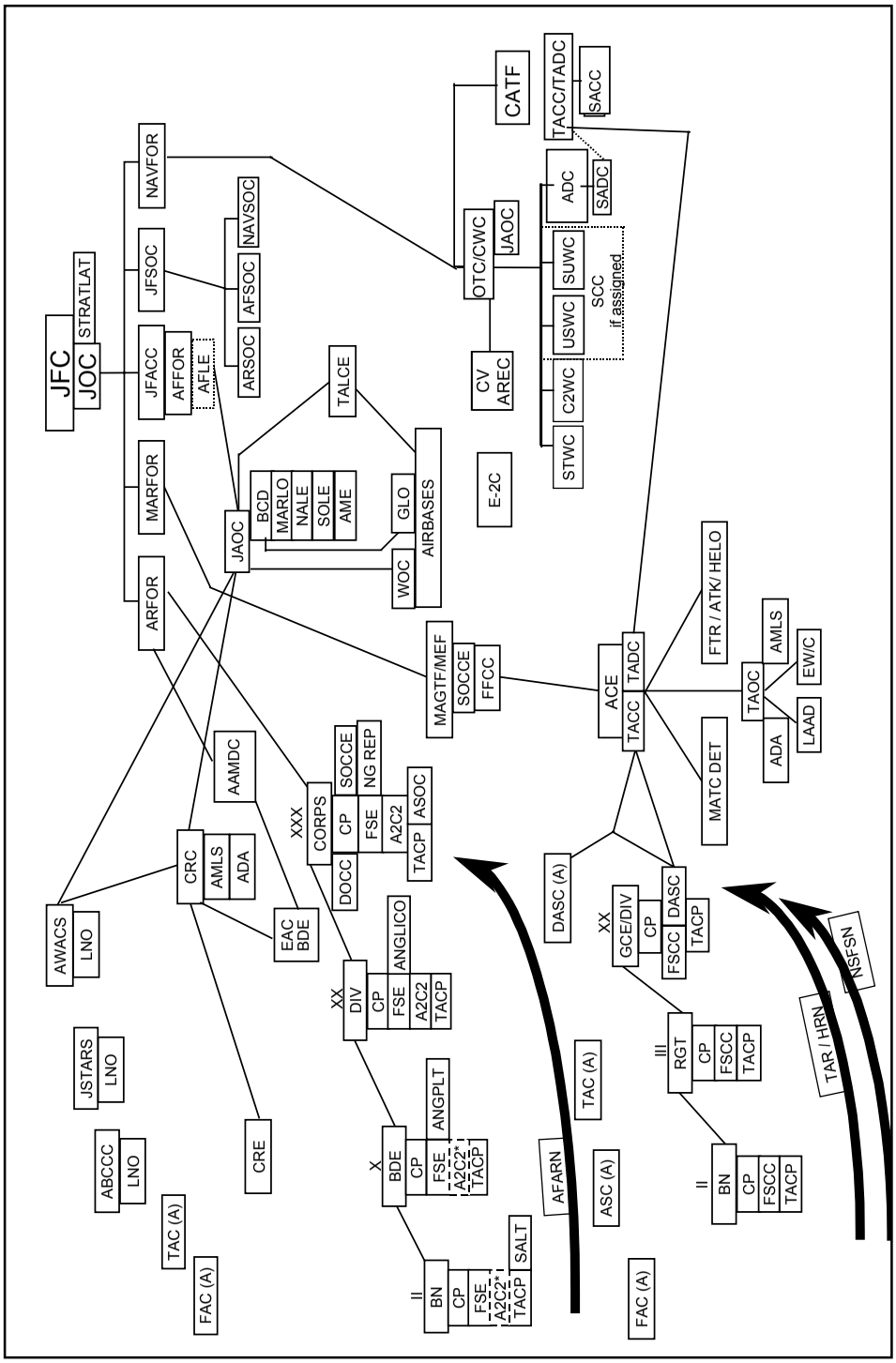
1-25. To fully understand the relationship of the A2C2 systems to the Theater Air-Ground System, planners must understand each service's system and its composition and structure. The TAGS is not a complete and separate system for airspace management within a theater of operations. It combines each service's airspace management system that supports the JFC. The TAGS is not a transparent airspace management system; rather, it provides the framework that allows each service system to exist in a joint and coalition force environment and support the JFC.

1-26. The A2C2 system is the airspace management component of the Army Air-Ground System (AAGS), which is a subsystem of the TAGS. FM 3-52.2 discusses multiservice procedures for TAGS. In addition to the AAGS, the TAGS integrates the Air Force Theater Air Control System (TACS), the Navy Tactical Air Control System (NTACS), and the Marine Air Command and Control System (MACCS). Units and elements comprising the A2C2 system should develop standing operating procedures to facilitate A2C2 operations. These procedures must consistently follow joint procedures defined in JP 3-52.

1-27. The TAGS is not a formal system in itself but rather the sum of the component air-ground systems operating in the theater. It applies to all theater operations to include air, ground, maritime, and amphibious operations. Individual service systems are described in detail and illustrated. Figure 1-1 on page 1-8 is a notional arrangement used to demonstrate the TAGS. Not all of the elements must be in place for all operations.

THEATER AIR CONTROL SYSTEM

1-28. The TACS is the backbone of Air Force forces' (AFFOR's) contribution to the TAGS. In a theater where the Air Force provides most of the air assets, it consists of the AFFOR's air operations center (AOC) (the focal point of TACS), coordination and liaison organizations, and AFFOR wing operations centers (WOCs). The TACS performs centralized planning and control of air support to ground and naval forces and facilitates decentralized execution of that support. Subordinate TACS elements perform liaison, planning, coordination, monitoring, and surveillance; control the reporting; and execute air operations tasks. Ground control and airborne warning agencies that support the TACS include the control and reporting center (CRC); the air mobility element (AME); airborne battlefield command and control centers (ABCCCs); Airborne Warning and Control Systems (AWACSs); and Joint Surveillance Target Attack Radar Systems (JSTARSs). For a detailed discussion of connectivity and command relationships of these elements see FM 3-52.2.



1. This figure shows a notional arrangement. Not all organizations and functions are needed in every case.
2. All possible connections are not shown.
3. Tactical Airspace Integration System (TAIS), when fielded, or air defense artillery elements will provide connectivity with AWACS and other reporting elements of the TAGS.
4. A2C2* - ad hoc elements perform A2C2 functions at US Army battalion and brigade levels. Currently no formal TOE A2C2 organization exists at these levels. The numerous airspace platforms and users may compel formal organizational changes.

Figure 1-1. Theater Air-Ground System (Notional)

1-29. Figure 1-2 illustrates the Air Force Theater Air Control System. The AFFOR commander works directly for the joint force commander. If the AFFOR commander is appointed as the joint force air component commander (JFACC), then he establishes a JAOC. Service components provide liaisons to include the battlefield coordination detachment (BCD), Army air and missile defense command (AAMDC) liaison team, Marine liaison officer (MARLO), naval and amphibious liaison element (NALE), special operations liaison element (SOLE), AME, and space liaison officer (SLO). Chapter 3 discusses each section in detail. In addition to these liaison elements, ground liaison officers (GLOs) working for the BCD at wing operations centers represent Army elements.

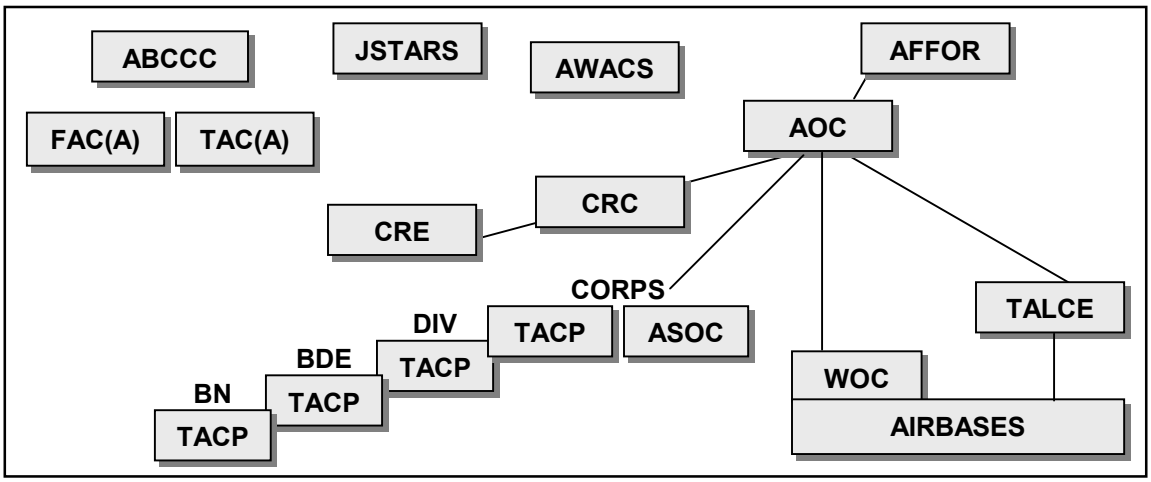


Figure 1-2. Air Force Theater Air Control System

1-30. The CRC is a facility that houses the airspace management liaison section (AMLS) staffed by all components. This section works in the senior radar control facility. In addition, the Army air defense artillery brigade provides the CRC with an air defense artillery (ADA) liaison responsible to the CRC for real-time air defense matters. Additionally, he informs the BCD of the current situation. Finally, the control reporting element (CRE)—a subordinate radar element of the CRC—extends the radar range of the CRC for early warning and aircraft control. It also provides early warning, surveillance, weapons control, and identification to the CRC. Chapter 3 details air ground support operations at the corps through battalion levels.

NAVY TACTICAL AIR CONTROL SYSTEM

1-31. The Navy employs the composite warfare commander (CWC) concept (see Figure 1-3 on page 1-10) as the doctrinal cornerstone of its operational and tactical information systems. The Navy employs the NTACS during amphibious operations. The CWC and NTACS encompass overall Navy command and control at sea.

Composite Warfare Commander Concept

1-32. The unique nature of maritime operations shapes the organization of US naval forces and affects how these forces fit into the overall unified military command structure. Vast distances, wide dispersion of forces with associated C2

challenges, and the complexities of conducting warfare in a three-dimensional battlespace characterize maritime operations. The CWC concept enables the officer in tactical command (OTC) of a naval force to aggressively wage defensive combat operations against air, surface, and subsurface threats while carrying out the primary offensive mission of the force. Depending on the mission and size of the force, the OTC may act as the CWC himself or assign more than one CWC. Subordinate warfare commanders are responsible to the CWC for the conduct of the tactical battle. The OTC or CWC may use a part or the entire concept. Key members of the CWC's organization include the air resource element coordinator, strike warfare commander, command and control warfare commander, undersea warfare commander, surface warfare commander, sea combat commander, and air defense commander.

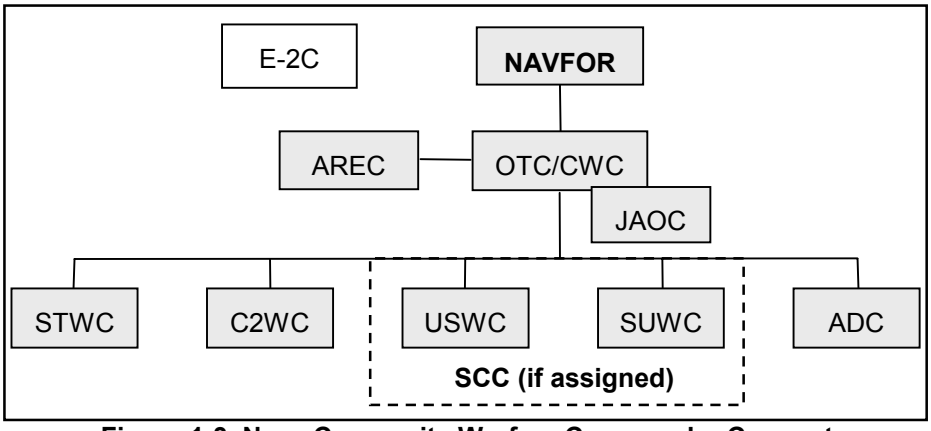


Figure 1-3. Navy Composite Warfare Commander Concept

1-33. **Air Resource Element Coordinator.** The air resource element coordinator (AREC), normally the carrier commanding officer, is a resource manager and an air warfare planner and coordinator. He is not a warfare commander. He acts as the air advisor to the OTC and CWC. The AREC is responsible for airspace planning and coordinates with the air defense commander in the airspace control function. The AREC produces the daily air plan that allocates aircraft to the various warfare commanders.

1-34. **Strike Warfare Commander.** The strike warfare commander (STWC) coordinates offensive power projection operations with respect to air and naval cruise missiles against land-based targets. He is normally the air wing commander located on an aircraft carrier. The STWC controls strike, C2, electronic combat, and support aircraft. He also integrates Tomahawk land-attack missiles (TLAMs) to support contingency operations or a theater campaign. These responsibilities give the STWC the greatest interface with other TAGS agencies and organizations during execution.

1-35. **Command and Control Warfare Commander.** The command and control warfare commander (C2WC) directs the management and exploitation of the electromagnetic and acoustic spectra. He develops the C2 warfare strategy for the force. This commander controls the electronic combat aircraft and shipboard systems involved in destroying or neutralizing electromagnetic targets. He also coordinates force, theater, and national surveillance assets to enhance friendly battlespace management.

1-36. **Undersea Warfare Commander.** The undersea warfare commander (USWC) must protect the battle group from undersea threats. He is usually a destroyer squadron commander co-located with the CWC onboard the aircraft carrier. The aircraft carrier provides the best tactical picture, C2 equipment, and information processing systems.

1-37. **Surface Warfare Commander.** The surface warfare commander (SUWC) must protect the battle group from surface threats. He may also be a destroyer squadron commander or the commanding officer of the aircraft carrier.

1-38. **Sea Combat Commander.** In low surface and subsurface threat environments, the responsibilities of the USWC and SUWC are often combined into a single sea combat commander. The naval component commander determines when to create the sea combat commander.

1-39. **Air Defense Commander.** The air defense commander is responsible to the CWC for air defense and airspace control around the battle group. He is normally the most senior commanding officer of a cruiser or guided missile destroyer. He controls fighter aircraft, E-2C (airborne early warning/control platform) aircraft, carrier-based tankers, and long-range surface-to-air missile capable ships.

1-40. **E-2C Hawkeye.** The E-2C Hawkeye is the Navy's carrier-based C2 platform that supports all the warfare commanders. The E-2C, an airborne early warning and control aircraft, can also serve as an airborne battlefield command and control center. The Hawkeye has a robust electronic surveillance capability and often operates with other ISR assets.

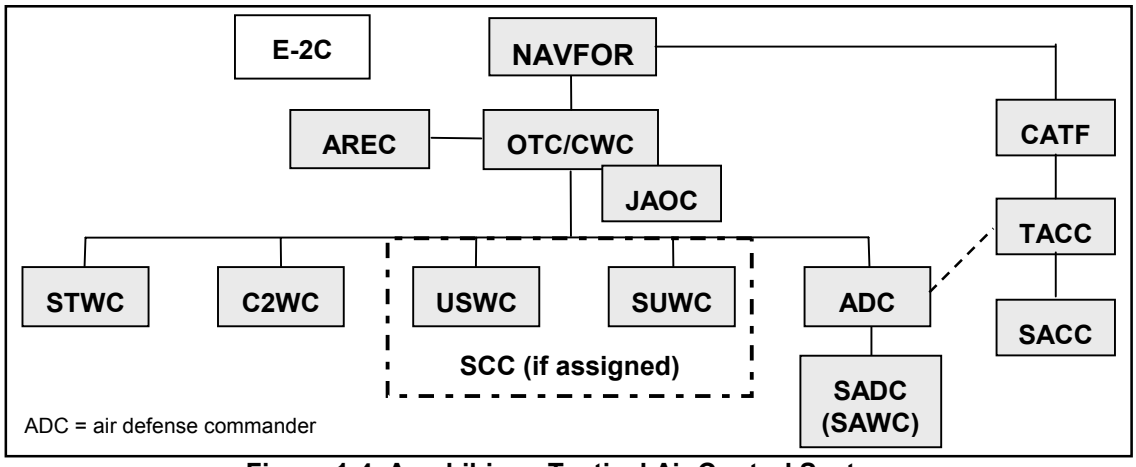


Figure 1-4. Amphibious Tactical Air Control System

Amphibious Tactical Air Control System

1-41. Amphibious Tactical Air Control System (ATACS) is the organizational structure used for command and control during amphibious operations. Figure 1-4 shows how it consists of the Navy Tactical Air Control System and the Marine Air Command and Control System. Its purpose is to plan, direct, and control air operations and supporting arms in the amphibious objective area (AOA) to accommodate the transition of the landing force once ashore. NTACS maintains positive control of all flights within the AOA from establishment by

the commander, amphibious task force (CATF) until all forces are ashore and airspace control is transferred to the MACCS.

1-42. NTACS is the organizational structure within which the CATF executes air operations in the AOA. The NTACS is found only during an amphibious operation. It is a relatively small organization compared to the MACCS. There are key components of the NTACS:

- The commander, amphibious task force is a Navy officer who controls all operations until the commander, landing force (CLF)—the senior officer in the landing force (may be Marine or Army)—is established ashore. In an amphibious operation, the CATF exercises control of all air operations in the AOA, including airspace control, until such functions are transferred to the CLF. He also establishes the ATACS to control air assets in the AOA and coordinates aviation assets with supporting forces.
- The tactical air control center is the primary air control agency from which all air operations supporting the amphibious operation are controlled. It is established aboard the CATF flagship and may be co-located with the combat direction center. Once the Marine tactical air command center sets up ashore and assumes responsibility for the command and control of aircraft, the Navy tactical air control center becomes a tactical air direction center (TADC). It becomes a backup for the Marine tactical air command center (TACC).
- The supporting arms coordination center (SACC) is located aboard an amphibious command ship close to the tactical air control center. It works closely with the tactical air control center to plan and coordinate artillery, naval gunfire, and air support. It also acts as the at-sea, functional counterpart to the Marine fire support coordination center (FSCC) or the Army fire support element (FSE).
- The sector air defense commander (SADC) performs sector air operations in the AOA and is subordinate to the air defense commander. Some doctrinal publications use the term sector air warfare coordinator (SAWC). The SADC has tactical control of surface-to-air weapons and assigned fighters within the sector.

MARINE AIR COMMAND AND CONTROL SYSTEM

1-43. Marine Air Command and Control System (see Figure 1-5) provides the aviation combat element (ACE) commander with the personnel, equipment, facilities, and procedures required to effectively command, control, and coordinate all Marine air-ground task force (MAGTF) air operations. The Marine air wing (MAW) provides the air command element with most necessary personnel and equipment to establish the MACCS. Pilots and naval flight officers (NFOs) fill critical billets within the MACCS, which requires the expertise of a Marine aviator and NFO. The tactical air command center, Marine air traffic control, tactical air operations center, low-altitude air defense, early warning/control, direct air support center, tactical air control party, and forward air controller (airborne) are the primary agencies of the MACCS.

1-44. The tactical air command center is the senior air command and control agency providing centralized command. It is the command post for the ACE commander. It consists of three sections: current operations, future operations, and future plans. Current operations monitor execution of the ATO and make

adjustments as dictated by the tactical situation. Future operations develop and disseminate the MAGTF air tasking order. Future plans develop the plan to support the next MAGTF mission.

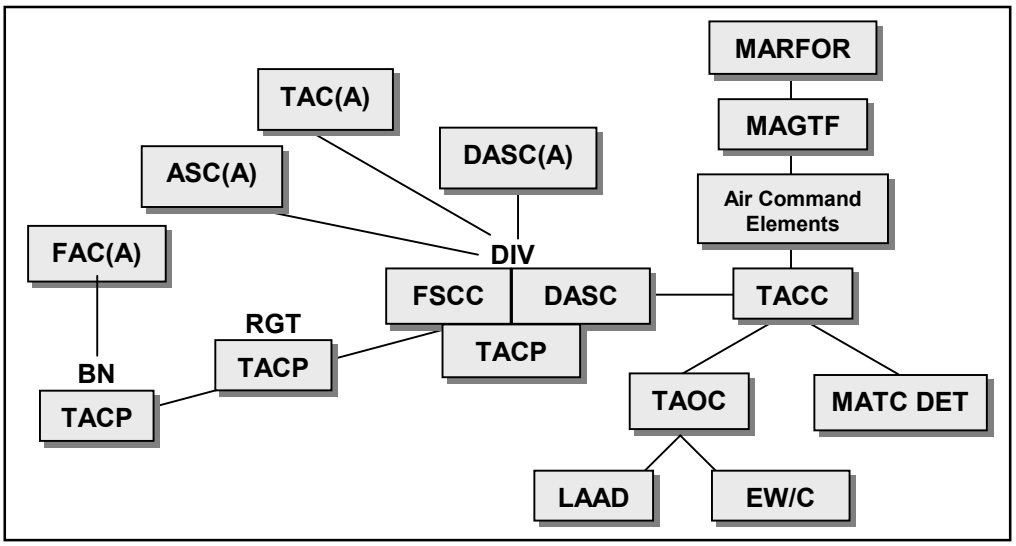


Figure 1-5. Marine Air Command and Control System

1-45. The Marine air traffic control (MATC) detachment provides continuous, all-weather air traffic control services to air bases and air facilities. It also provides expeditionary airfields and remote area landing sites as a part of the MACCS.

1-46. The tactical air operations center (TAOC) is the radar agency that conducts antiair warfare (AAW), en route air traffic control, navigational assistance, surveillance, data link, and identification functions. It controls AAW aircraft and surface-to-air weapons in its assigned sector. The TAOC conducts theater ballistic missile defense and tactical digital information link (TADIL)-A, -B, and -J operations.

1-47. A low-altitude air defense (LAAD) unit provides close in, low altitude surface-to-air weapons fires utilizing the Stinger and Avenger missile systems. It defends either one or a combination of forward combat areas, maneuver forces, vital areas, installations, and units engaged in special or independent operations.

1-48. An early warning/control (EW/C) site is subordinate to and echeloned from a TAOC. This site is task organized to perform AAW, en route air traffic control, navigational assistance, surveillance, data link, and identification missions. While maintaining a smaller footprint than a TAOC, the EW/C site has the same functions but on a smaller scale.

1-49. The direct air support center (DASC) provides procedural control services. It is the air control agency responsible for decentralized execution of immediate close air support and assault support missions. It processes and coordinates requests for immediate air support. It is normally co-located with the senior FSCC or force fires coordination center. The DASC consists of—

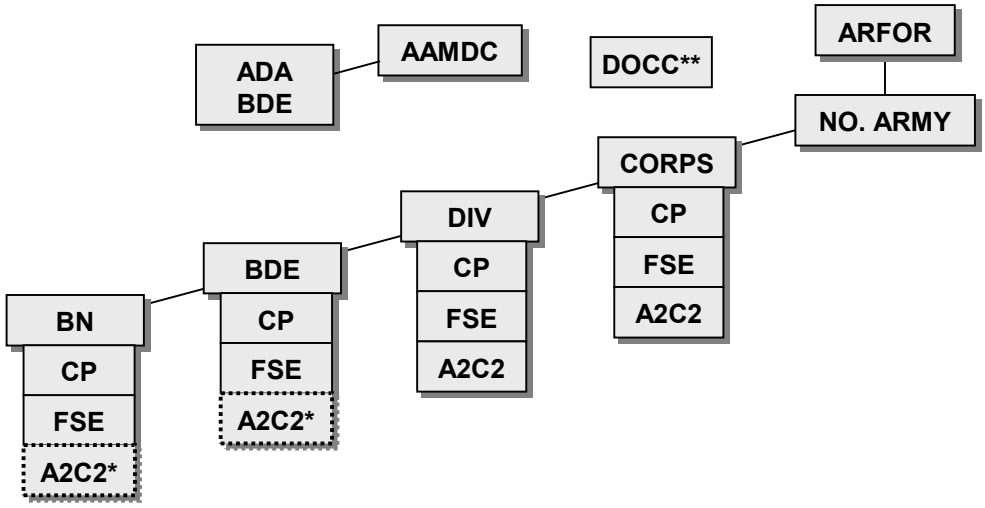
- The direct air support center (airborne) (DASC[A]). It is subordinate to and performs the same functions as the DASC. It augments the DASC during periods of degraded capabilities, adverse communication conditions, and amphibious operations while control is being phased ashore. The DASC(A) operates from a specially configured KC-130, Hercules.
- The air support element. It is subordinate to, performs the same functions as, and has the same capability as the DASC. It is task organized to perform various air support control functions. Employment options can range from Marine expeditionary unit level operations characterized by limited assets and endurance to a multidivision operation. The air support element is almost identical in capabilities—but set apart in responsibilities—and subordinate to the DASC. The air support element can function as an extension of the Navy tactical air control center or helicopter direction center with the battalion tactical air control party.
- The tactical air coordinator (airborne) (TAC[A]). He performs as an airborne extension of the DASC or FSCC and deconflicts aircraft through airspace coordination. He coordinates aircraft with other supporting arms, such as artillery or naval gunfire.
- The assault support coordinator (airborne) (ASC[A]). He provides air coordination and control during helicopter operations. He also serves as an extension of the DASC or helicopter direction center to support the air mission commander. He coordinates airspace and assault support operations; movement of air assault aircraft through airspace; and close air support providing for helicopter assault operations.

1-50. The tactical air control party (TACP) is an integral part of each combat unit from division down to the battalion level. It acts as an air advisor to the maneuver unit, assists in the submission of preplanned and immediate air support requests, and provides terminal control for supporting aircraft.

1-51. The forward air controller (airborne) (FAC[A]) is the airborne extension of the ground forward air controller (FAC). He performs air reconnaissance and surveillance; has terminal control of close air support, artillery, and naval gunfire radio relay for ground FACs; and maintains landing zone preparations.

ARMY AIR-GROUND SYSTEM

1-52. The AAGS (see Figure 1-6) provides the control system for synchronizing, coordinating, and integrating air operations with the commander's scheme of maneuver. The AAGS provides the means to initiate, receive, process, and execute requests for air support and to disseminate information and intelligence produced by aerial assets. Some elements of the AAGS come as liaisons and are provided by the Air Force. These elements are the theater airlift liaison officer (TALO), TACP, and the air support operations center (ASOC). They function as a single entity in planning, coordinating, deconflicting, and integrating the air support operations with ground elements. The principal Army agencies are command posts (CPs), FSEs, air defense elements, A2C2 elements (detailed discussion in Chapter 2), and coordination and liaison elements, such as the BCD, Theater Army Air and Missile Defense Coordinator, and GLOs. Chapter 3 discusses each element of the system in detail. FM 3-52.2 discusses these agencies.



A2C2* – ad hoc elements perform A2C2 functions at US Army battalion and brigade levels. Currently no formal TOE A2C2 organization exists at these levels. The proliferation of airspace platforms and users may compel formal organizational changes.
DOCC** – DOCC is not a separately specified orgainzation within the AAGS. It is shown because it requires extensive organization with the AAGS organizations. The DOCC is found at corps and EAC; divisions may use internatl resources and assets to esablish a DOCC.

Figure 1-6. Army Air-Ground System

JOINT AIR OPERATIONS CENTER

JAOC Divisions

- **Combat Plans Division**
- **Combat Operations Division**
- **Combat Intelligence Division**

1-53. The joint air operations center is the senior level for airspace management within a theater of operations. It provides the JFACC with the required staff to support his responsibilities. The JAOC supports component air assets by planning, coordinating, executing, controlling, monitoring, assessing, and reporting air operations. When the JFACC is a naval officer, the air component headquarters will probably be the naval component's air resource element coordinator's center. When the JFACC is a Marine officer, it will likely be a Marine tactical air command center. When the AFFOR commander is named the JFACC, the AOC becomes the JAOC. The JAOC is task-organized, directed by the JFACC, and consists of at least three divisions. These divisions are combat plans, combat operations, and combat intelligence.

1-54. The combat plans division focuses on future joint air operations. Functioning like the main command post of a maneuver force, the division looks beyond the current operation. It normally develops the joint air operations strategy, air apportionment recommendations, and the joint ATO. It consists of the air strategy branch, airspace command and control, and joint ATO development and production branch.

1-55. The combat operations division monitors and executes current joint air operations. This division functions much like a maneuver force tactical CP that monitors and directs the current fight. It consists of the current operations branch, weather support branch, operations support branch, and joint search and rescue branch.

1-56. The combat intelligence division is responsible for all intelligence activities in the JAOC. It provides intelligence support to both the combat plans and combat operations divisions by positioning cells at each division. The plans intelligence cell is located with the combat plans section. The operations intelligence cell provides support to the combat operations division. The intelligence cell develops and disseminates the relevant threat picture. Included in this picture are the effects of weather and terrain on threat and friendly forces, which is necessary for mission planning and execution. JP 3-56.1 provides details for each of these divisions.

KEY COMPONENT LIAISONS WITHIN TAGS

1-57. Effective liaison between forces is essential for coordinated TAGS operations and successful joint operations. Each component provides liaison elements to the JAOC. These liaisons consist of experienced warfare specialists who provide component planning, coordination, and tasking expertise capabilities. These liaison elements work for their respective component commanders and work with the JFACC and JAOC staff. They coordinate and deconflict component direct air support air operations with joint air operations. For this discussion, the JFACC also has the responsibilities of the ACA and area air defense commander (AADC). JP 3-56.1 and FM 3-52.2 have complete discussions of the liaison elements.

TAGS Liaisons

- **Navy Liaison**
- **Marine Liaison**
- **Air Force Liaison**
- **Army Liaison**
- **Special Operations Liaison**
- **Airspace Management Liaison Section**
- **Air Mobility Element**
- **Air Defense Liaison Section**
- **Additional Liaisons**

NAVY LIAISON

1-58. The naval and amphibious liaison element represents the maritime component commander. It is responsible to the JAOC on matters pertaining to Navy and Marine amphibious operations. The NALE processes requests for naval air support, monitors and interprets the naval situation for the JAOC, and exchanges maritime intelligence and operational data. Additionally, the NALE coordinates maritime requirements for air defense and monitors Navy and Marine airspace and air traffic control requirements and changes.

MARINE LIAISON

1-59. The Marine liaison officer represents the MAGTF commander in the JAOC. The MARLO processes requests for Marine air support, performs the airspace coordination functions necessary to successfully accomplish the MAGTF operations, and provides intelligence information gathered during littoral operations.

AIR FORCE LIAISON

1-60. The Air Force Liaison Element (AFLE) provides an interface between the AFFOR commander and the JFACC. It coordinates and synchronizes requests for theater and strategic Air Force assets to support joint operations. The AFLE performs various missions, to include planning for theater airlift.

ARMY LIAISON

1-61. The ARFOR commander provides the JAOC with an Army liaison element formed as a battlefield coordination detachment. This detachment processes Army requests for air support, monitors and interprets the land battle situation for the JAOC, provides the necessary interface for the exchange of current intelligence and operational data, and provides the Army liaison to the airspace management control team. See FM 3-09.13 for more information.

SPECIAL OPERATIONS LIAISON

1-62. The special operations liaison element is provided to the JFACC. The SOLE coordinates, deconflicts, and integrates special operations forces (SOF) air and surface effects with joint operations.

AIRSPACE MANAGEMENT LIAISON SECTION

1-63. The airspace management liaison section is staffed by all components. It is responsible to the ACA for planning, coordinating, and integrating activities related to airspace control in the JAOC. Additionally, these component representatives address the real-time airspace management issues that arise while executing air operations. The AMLS is located with the TACS element performing airspace management.

AIR MOBILITY ELEMENT

1-64. The air mobility element provides the planning and coordination of all strategic airlift operations in a theater. This element ensures that the strategic air mobility missions integrate with theater air and space operations planning.

AIR DEFENSE LIAISON SECTION

1-65. The air defense liaison section is staffed by all components. It is responsible to the AADC for planning, coordinating, and integrating activities related to air defense. Liaison officers assist in rapidly engaging airborne threats. The air defense liaison section is normally located with the senior radar facility.

1-66. If additional components, such as multinational forces, are present during operations, then these elements will provide liaison personnel to the JFACC, ACA, and AADC. These liaisons provide the service expertise necessary to coordinate and execute airspace control and air defense activities.

KEY POSITIONS AND RESPONSIBILITIES

1-67. There are four key positions critical to planning for and executing airspace control. These four positions—the joint force commander, joint force air component commander, airspace control authority, and area air defense commander—are responsible for various tasks.

Key Positions

- **Joint Force Commander**
- **Joint Force Air Component Commander**
- **Airspace Control Authority**
- **Area Air Defense Commander**

JOINT FORCE COMMANDER

1-68. The joint force commander has many responsibilities, to include the airspace control. For airspace control, the JFC specifically must—

- Include overall responsibility of airspace control and air defense in a joint theater of operations.
- Establish airspace control objectives and priorities for the joint force.
- Oversee the planning and force integration activities that affect the TAGS, such as apportionment and targeting guidance.
- Resolve matters on which the ACA is unable to obtain agreement.
- Possibly retain airspace control responsibilities (or he may appoint an ACA).

1-69. The JFC may designate a JFACC as a single component commander for theater- or JOA-wide counterair operations. The JFACC will have the preponderance of air power. He also has the ability to provide C2 and produce and disseminate an ATO and ACO. He is normally appointed as the ACA and AADC. The JFC normally tasks the same person as the ACA, AADC, and JFACC to maintain the flexibility to effectively meet the enemy air threat and manage airspace control. Additional information on the selection and responsibilities of the JFACC can be found in JP 3-56.1.

JOINT FORCE AIR COMPONENT COMMANDER

1-70. The JFACC may be sea or land based. The responsibilities are the same. However, the sea-based JFACC's staff will be smaller due to the limited berthing space aboard Navy combatant ships and will affect the joint air planning capacity. The JFACC responsibilities include—

- Developing a joint air operations plan to best support force objectives.
- Recommending apportionment of the joint air effort to the JFC.
- Providing centralized direction for the allocation and tasking capabilities and forces.
- Controlling execution of joint operations as specified by the JFC.
- Coordinating joint air operations with operations of other component commanders and forces assigned to or supporting the JFC.
- Evaluating the results of joint air operations.
- Functioning as the supported and supporting commander, as directed by the JFC.

AIRSPACE CONTROL AUTHORITY

1-71. The ACA is responsible for operating the airspace control system in the airspace control area. The JFC can delegate authority to authorize deviations from established policies and procedures when urgent or emergency combat situations arise. Centralized direction by the ACA does not imply assumption of operational or tactical control over any air assets.

1-72. The ACA has broad responsibilities to include—

- Coordinating, integrating, and regulating the use of the airspace in the area of operations.
- Establishing broad policies and procedures for airspace control.

- Establishing the airspace control system and integrating host-nation and multinational forces.
- Developing the airspace control plan.
- Implementing the airspace control plan through the airspace control order.

AREA AIR DEFENSE COMMANDER

1-73. The AADC is responsible for planning, coordinating, and integrating the joint area air defense plan. The AADC develops broad policies and procedures for air defense. The JFC defines the support relationship between the AADC and supporting commanders. He may apportion assets to the AADC to conduct the joint air defense operations.

1-74. The AADC has broad responsibilities to include—

- Developing and executing a plan to disseminate timely cueing of information and air and missile early warnings.
- Planning, coordinating, and integrating joint air defense operations.
- Developing and implementing identification and engagement procedures for air and missile threats.
- Appointing a deputy AADC to assist the AADC in planning and coordinating air and missile defense operations.

KEY DOCUMENTS

1-75. There are several documents critical to planning for and executing airspace control. These documents are the airspace control plan, airspace control order, air tasking order, and air defense plan. A2C2 planners should know these documents.

Key Documents

- **Airspace Control Plan**
- **Airspace Control Order**
- **Air Tasking Order**
- **Air Defense Plan**

AIRSPACE CONTROL PLAN

1-76. The ACP is developed by the ACA and approved by the JFC. It summarizes the JFC's guidance on airspace control, defines the joint force airspace control organization, and outlines the airspace control process. This plan may be published either as an annex to the basic OPLAN and OPORD or as a separate document. Because the ACP delineates the airspace control area, planners must address coordination procedures for all airspace users. See JP 3-52 for more details.

AIRSPACE CONTROL ORDER

1-77. The ACO is developed from the airspace control plan. It directs the use of joint airspace and details the approved requests for airspace control measures. The ACO is published on a cyclical basis, depending on the theater. Normally, the ACA publishes and distributes it daily. It may be part of the ATO or a standalone document. It may be a perpetual document with published ongoing updates. While the airspace control plan provides general guidance on airspace control, the order institutes airspace control procedures for specified periods. The ACO contains modifications to the ACP guidance and procedures, and it activates or deactivates procedural control measures. The ACO lists, but is not

limited to, ACMs and procedures used on or over the area of operations (see Chapter 4). It may include FSCMs and standing operating procedures.

1-78. Two important considerations when distributing the ACO are timing and dissemination means. The ACO and ATO cycles interrelate. Whatever publication and distribution means are used, it is critical to mission success that airspace users receive pertinent airspace information as early in the planning cycle as possible. FM 3-52.2 provides additional details on the ACO.

AIR TASKING ORDER

1-79. The ATO is a detailed order developed by the JFACC that describes and directs the overall air operation. This order provides the details for individual sorties to include targets, mission timing, weapons loads, air refueling data, call signs, and special instructions (SPINS). The SPINS are free text formats included as part of the ATO. They contain essential information that highlights, modifies, or supplements data contained in other portions of the ATO. These instructions may also contain data that modifies, changes, or replaces information contained in OPORDs. Such information includes airspace changes, IFF and SIF assignments, control agencies, and frequencies. Developing and executing the ATO is a continuous dynamic process. JP 3-56.1 and FM 3-52.2 detail this process.

AIR DEFENSE PLAN

1-80. The AADC—with the support and coordination of the service and functional commanders—develops, integrates, and distributes the JFC-approved air defense plan. Because air defense and airspace control and management are inherently related areas, the air defense plan and the ACP should be developed together to avoid conflicts. The air defense plan includes—

- Sensor employment.
- Identification procedures.
- Engagement procedures.
- Defensive airspace control procedures (developed with the ACA).
- Weapon control procedures.
- Early warning dissemination.
- Additional information that may discuss—
  - Location and type of assets to be defended.
  - Disposition and capabilities of enemy air and missile forces.
  - Disposition and location of friendly air and missile defense forces.
  - Geopolitical and other constraints that affect air defense operations.

1-81. In addition to the air defense plan, the AADC publishes a tactical operational data (TACOPDAT) message to establish air defense responsibilities or to provide supplementary air defense orders. This message may be used to report permanent changes to an OPORD or to update missile engagement zones, surveillance and defense sectors, and communication nets. The AADC also will publish an operational tasking data link message to establish relationships, configurations, coordination procedures, and other information necessary to conduct data link operations. Chapter 5 has more information on data links.